

### **REMARKS**

In the Office Action, claims 1-51 were rejected. By the present Response, claims 1, 12-13, 15, 20-22, 26-28, 33-37 and 41-45 are amended. Upon entry of the amendments, claims 1-51 will remain pending in the present patent application. Reconsideration and allowance of all pending claims are requested.

### **Objections to the Claims**

The Examiner objected claims 1, 15, 22, 28, 37 and 45 due to informalities in the form of absence of suitable articles. By this present Response, the informalities have been corrected.

### **Rejections Under 35 U.S.C. § 102**

In the Office Action, claims 1-5, 7, 12-13, 15-17, 19-23, 25-27, 45-47 and 49 were rejected under 35 U.S.C. § 102(b) as being anticipated by Sprangle et al., U.S. Patent No. 5,353,291. In paragraph 3 of the "Detailed Action" the Examiner failed to list claim 15. However, claim 15 was addressed in paragraph 4 of the "Detailed Action". Applicants therefore believe that the Examiner intended to reject claim 15 on the same basis.

Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. Applicants respectfully assert that the present invention, as recited in amended independent claims 1, 15, 22 and 45 is patentable over the Sprangle reference.

Independent claims 1 and 15 are amended to more clearly point out certain of the claimed subject matter. Specifically, each independent claim now recites, in generally similar language, *generating high-energy optical pulses in a laser cavity*. Claims 22 and 45 already included similar recitations.

The Sprangle reference discloses a laser source 22 that generates a laser beam 12. In addition, the Sprangle reference states that the laser beam 12 enters the ring resonator 56 formed by two mirrors 26 and 28 located within a vacuum or interaction chamber 32. The other two mirrors 34 and 36 are located outside the interaction chamber 32 and reflect the laser beam 12 in a close loop (*see*, Sprangle, column 3, line 10-18). However, the reference does not teach or disclose a laser source to be present within the interaction chamber. Applicants respectfully submit that the laser system 12 described in the present application is not limited to the laser 22 disclosed by Sprangle reference. The laser system 12 described in the present application includes the laser cavity 20 within which a laser rod 42 is disposed to generate the optical pulses or the laser beam 16. Thus, the laser beam 16 is *generated within* the laser cavity 20 and no external laser source is required. Further, a plurality of mirrors 32 are located within the laser cavity 20.

Further, a high-energy laser beam 16 is generated within the laser cavity 20 by the laser system 12 described in the application. No external Table-Top Terawatt (T3) laser system 22 is employed for generating such high-energy laser beam as disclosed by Sprangle reference (*see*, Sprangle, column 2, line 6-20). The generation of the high-energy laser beam 16, in the claimed arrangement is local to the laser cavity 20.

At least because Sprangle et al. do not disclose or suggest a technique that involves generating a laser beam in a laser cavity in which x-rays are generated as claimed, the reference cannot support a *prima facie* case of anticipation of claims 1, 15, 22 or 45. Claims 2-5, 7, 12-13, 16-17, 19-21, 23, 25-27, 46-47 and 49 depend directly or indirectly from claims 1, 15, 22 and 45. Accordingly, the Applicants submit that claims 2-5, 7, 12-13, 16-17, 19-21, 23, 25-27, 46-47 and 49 are allowable by virtue of their dependency from an allowable base claim. Applicants also submit that the dependent claims are further allowable by virtue of the subject matter they separately recite. Thus, it is respectfully requested that the rejections of claims 1-5, 7, 12-13, 15-17, 19-23, 25-27, 45-47 and 49 under 35 U.S.C. §102(b) be withdrawn.

**Rejections Under 35 U.S.C. § 103**

Claims 8-11 and 50-51 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sprangle et al. in view of Erbert et al., U.S. Patent No. 6,760,356. Claims 6, 18, 24 and 48 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sprangle et al. in view of Weingarten et al., U.S. Patent Application No. 2003/0174741. Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sprangle et al. in view of Antonell et al., U.S. Patent No. 6,760,356. Claims 28-30, 32-38 and 40-44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sprangle et al. in view of Hartemann et al., U.S. Patent No. 6,724,782. Claims 31 and 39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sprangle et al. in view of Hartemann et al. and further in view of Weingarten et al.

Independent claim 28 is amended to more clearly point out certain of the claimed subject matter. Specifically, the independent claim now recites, *generating high-energy optical pulses in a laser cavity*.

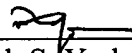
At least because the Sprangle reference, as discussed above, fails to teach or suggest generating such optical pulses in the laser cavity, and as none of the remaining references were argued to do so, the Applicants submit that a *prima facie* case of obviousness is not supported against claims 6, 8-11, 14, 18, 24, 28-44, 48, 50-51 for rejection under 35 U.S.C. § 103(a). Thus, it is respectfully requested that the rejections of claims 6, 8-11, 14, 18, 24, 28-44, 48, 50-51 under 35 U.S.C. § 103(a) be withdrawn.

**Conclusion**

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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